

GUJARAT TECHNOLOGICAL UNIVERSITY
M.E.in VLSI System Design
Semester: I

Subject Name: **Advanced DSP System & Architecture (Major Elective –I)**
 Subject Code: **714204**

Course content	Total Hrs.
Introduction to Digital Signal Processing: Discrete time systems, Analysis of Discrete-time Linear time invariant systems, Frequency analysis of Discrete time signals and Fourier Transform properties, Frequency Response of LTI system, The Z-transforms, Inverse Z-transforms	4
Discrete Time Systems: Structures for FIR,IIR Systems, Quantization of Filter Co-efficients, Round-off Effects in Digital Filters	3
Discrete Fourier Transform & Fast Fourier Transform: Properties of DFT, Circular Convolution, frequency analysis of signals using the DFT. Efficient computation of DFT (FFT Algorithms-DIT and DIF), Application of FFT Algorithms, The Goertzel Algorithm, The Chirp-z Algorithm.	10
Design of Digital Filters: Design Techniques of FIR Filters – Windowing methods, frequency sampling method ,Optimum Equiripple Linear Phase Filters, FIR differentiators, Hilbert Transformers; design techniques of IIR filters : Impulse invariance. Bilinear transformation, finite difference, frequency sampling method, Frequency Transformations	8
Introduction to Digital Signal Processors: General Purpose and Special Purpose Digital Signal Processors	03
DSP Development System: Introduction, support tools, code composer studio, programming examples to test of DSK tools	05
Architecture and Instruction set of TMS320C6x Processor: Introduction, TMS320C6x architecture , fuctional units, instruction set, assembler directives, timers, interrupts, multi-channel buffered serial port (McBSP), Direct Memory Access, Fixed point and floating point data representation, memory consideration, programming examples, Advanced Processors(DaVinci) .	12
DSP Applications	2

Laboratory work:

It will consist of 10 to 12 experiment based on above syllabus.

References Books:

1. J.G. Proakis and D.G. Manolakis - Digital Signal Processing: Principles Algorithms and Applications,4th Edition Pearson Education, 2007
2. B.Venkataramani and M.Bhaskar, "Digital Signal Processors Architecture,Programming and Applications" –TMH ,2003
3. S.K. Mitra - Digital Signal Processing: A computer based approach, TMH, 2001 A.V. Oppenheim, R.W. Schafer - Digital Signal Processing, Pearson Education, 2004
4. Thomas J. Cavicchi, Digital Signal Processing,Wiley India Emmanuel Ifeachor,Barry Jervis Digital Signal Processing, 2nd Edition, Pearson Education, 2002
5. Li Tan , Digital Signal Processing fundamentals and applications,Elsevier